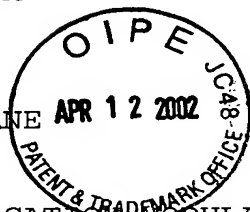SEQUENCE LISTING

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         FERREIRA, PAULO

         ROMBAUTS, STEPHANE

<120>   PLANT DNA REPLICATION MODULATING PROTEINS

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<140>   US 10/036,492
<141>   2002-01-07

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Ser Pro Ile Ser Leu Ala Glu Asp Gly Phe Thr Val Thr Leu Ser Pro
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Glu Ser Pro Ser Ala Pro Ala Ser Phe Ala Cys Ser Leu Asp Leu Gln
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Glu Asn Val Val Leu Glu Gln Phe Met Asp Pro Arg Ser Leu Thr Leu
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Leu Pro Lys Arg Ser Arg Asn Asp Gly Asn Asp Val Asn Tyr Ser Val
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Ile Asp Ser Arg Pro Asn Asp Ile Arg Thr Val Ala Cys Gly Thr Met
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Leu Gly Thr Ile Leu Ala Leu Glu Ser Gln Ala Ser Val Phe Asn Leu
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Ser Ala Ser Asn Arg Gly Ile Glu Ala Phe Val Gln Asp His Gln Pro
        195             200             205

Gly Pro Gln Thr Ser Asn Ala Ser Val Asp Val Asn Pro Thr His Arg
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Tyr Glu Arg Pro Glu Ile Gly Asp Phe Gln Ile Ala Asp Asn Gln Ile
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Glu Asp Leu Leu Val Asp Asp His Thr Val Asp Ile Val Ser Thr Pro
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Asp Arg Glu Leu Pro Leu Lys Pro Ser Ala Thr Glu Ala Asn Gln Asp
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His Val Gly Ala Gln Lys Tyr Tyr Val Asn Asn Glu Ile Arg Met Leu
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Arg Pro Asp Ser Leu Lys Arg Glu Ile Asp Val Tyr Gln Leu Gln Trp
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Tyr Gly Tyr Cys Met Phe Lys Ala Leu Ser Ser Leu His Lys Gln Gly
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Val Val His Arg Asp Val Lys Pro Gly Asn Phe Leu Phe Ser Arg Lys
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Thr Asn Lys Gly Tyr Leu Ile Asp Phe Asn Leu Ala Met Asp Leu His
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Gln Lys Tyr Arg Arg Ala Asp Lys Ser Lys Ala Ala Ser Gly Leu Pro
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Thr Ala Ser Lys Lys His His Thr Leu Val Lys Ser Leu Asp Ala Val
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Asn Arg Gly Thr Asn Lys Pro Ser Gln Lys Thr Leu Ala Pro Asn Ser
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Ile Lys Lys Ala Ala Gly Lys Thr Arg Ala Arg Asn Asp Met Thr Arg
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Trp Glu Arg Leu Asn Ser Gln Gly Ala Glu Gly Ser Gly Leu Thr Ser
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Ala Lys Asp Val Thr Ser Thr Arg Asn Asn Pro Ser Gly Glu Lys Arg
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Arg Glu Pro Leu Pro Cys His Gly Arg Lys Ala Leu Leu Asp Phe Leu
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Glu Lys Glu Leu Leu Tyr Leu Thr Pro Met Pro Leu Cys Ser Asn Gly
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Arg Pro Glu Ala Gly Asp Val Ile Glu Lys Lys Asp Gly Pro Cys Ser
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Gly Thr Lys Gly Phe Arg Ala Pro Glu Val Cys Phe Arg Ser Leu His
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Gln Gly Pro Lys Ile Asp Val Trp Ser Ala Gly Val Thr Leu Leu Tyr
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Leu Ile Met Gly Arg Thr Pro Phe Thr Gly Asp Pro Glu Gln Asn Ile
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Arg Tyr Leu Lys Gly Met Glu Leu Arg Lys Trp Cys Glu Leu Asn Thr
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Lys Arg Arg Glu Phe Leu Asp Val Ile Pro Leu Ser Leu Leu Asp Leu
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Val Asp Lys Cys Leu Thr Val Asn Pro Arg Arg Arg Ile Ser Ala Glu
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Asp Ala Leu Lys His Asp Phe Phe His Pro Val His Glu Thr Leu Arg
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<213>   Arabidopsis thaliana

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            20   25   30

Phe Pro Ser Glu Val Asn Leu Gln Leu Leu Ala Arg Cys Tyr Leu Ser
            35   40   45

Asn Ser Gln Ala Tyr Ser Ala Tyr Tyr Ile Leu Lys Gly Ser Lys Thr
    50   55   60

Pro Gln Ser Arg Tyr Leu Phe Ala Phe Ser Cys Phe Lys Leu Asp Leu
65   70   75   80

Leu Gly Glu Ala Glu Ala Ala Leu Leu Pro Cys Glu Asp Tyr Ala Glu
            85   90   95

Glu Val Pro Gly Gly Ala Ala Gly His Tyr Leu Leu Gly Leu Ile Tyr
            100   105   110

Arg Tyr Ser Gly Arg Lys Asn Cys Ser Ile Gln Gln Phe Arg Met Ala
        115   120   125

Leu Ser Phe Asp Pro Leu Cys Trp Glu Ala Tyr Gly Glu Leu Cys Ser
    130   135   140

Leu Gly Ala Ala Glu Glu Ala Ser Thr Val Phe Gly Asn Val Ala Ser
145   150   155   160

Gln Arg Leu Gln Lys Thr Cys Val Glu Gln Arg Ile Ser Phe Ser Glu
            165   170   175

Gly Ala Thr Ile Asp Gln Ile Thr Asp Ser Asp Lys Ala Leu Lys Asp
            180   185   190

Thr Gly Leu Ser Gln Thr Glu His Ile Pro Gly Glu Asn Gln Gln Asp
        195   200   205

Leu Lys Ile Met Gln Gln Pro Gly Asp Ile Pro Pro Asn Thr Asp Arg
    210   215   220

Gln Leu Ser Thr Asn Gly Trp Asp Leu Asn Thr Pro Ser Pro Val Leu
225   230   235   240

Leu Gln Val Met Asp Ala Leu Pro Pro Leu Leu Leu Lys Asn Met Arg
                245   250   255

Arg Pro Ala Val Glu Gly Ser Leu Met Ser Val His Gly Val Arg Val
            260   265   270

Arg Arg Arg Asn Phe Phe Ser Glu Glu Leu Ser Ala Glu Ala Gln Glu
        275   280   285

Glu Ser Gly Arg Arg Arg Ser Ala Arg Ile Ala Ala Arg Lys Lys Asn
    290   295   300

Pro Met Ser Gln Ser Phe Gly Lys Asp Ser His Trp Leu His Leu Ser
305   310   315   320

Pro Ser Glu Ser Asn Tyr Ala Pro Ser Leu Ser Ser Met Ile Gly Lys
            325   330   335

Cys Arg Ile Gln Ser Ser Lys Glu Val Ile Pro Asp Thr Val Thr Leu
        340   345   350

Asn Asp Pro Ala Thr Thr Ser Gly Gln Ser Val Ser Asp Ile Gly Ser
        355   360   365

Ser Val Asp Asp Glu Glu Lys Ser Asn Pro Ser Glu Ser Ser Pro Asp
    370   375   380

Arg Phe Ser Leu Ile Ser Gly Ile Ser Glu Val Leu Ser Leu Leu Lys
385   390   395   400

Ile Leu Gly Asp Gly His Arg His Leu His Met Tyr Lys Cys Gln Glu
            405   410   415

Ala Leu Leu Ala Tyr Gln Lys Leu Ser Gln Lys Gln Tyr Asn Thr His
        420   425   430

Trp Val Leu Met Gln Val Gly Lys Ala Tyr Phe Glu Leu Gln Asp Tyr
        435   440   445

Phe Asn Ala Asp Ser Ser Phe Thr Leu Ala His Gln Lys Tyr Pro Tyr
    450   455   460

Ala Leu Glu Gly Met Asp Thr Tyr Ser Thr Val Leu Tyr His Leu Lys
465   470   475   480

Glu Glu Met Arg Leu Gly Tyr Leu Ala Gln Glu Leu Ile Ser Val Asp
                485   490   495

Arg Leu Ser Pro Glu Ser Trp Cys Ala Val Gly Asn Cys Tyr Ser Leu
            500   505   510

Arg Lys Asp His Asp Thr Ala Leu Lys Met Phe Gln Arg Ala Ile Gln '
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Leu Asn Glu Arg Phe Thr Tyr Ala His Thr Leu Cys Gly His Glu Phe
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Ala Ala Leu Glu Glu Phe Glu Asp Ala Glu Arg Cys Tyr Arg Lys Ala
545   550   555   560

Leu Gly Ile Asp Thr Arg His Tyr Asn Ala Trp Tyr Gly Leu Gly Met
            565   570   575

Thr Tyr Leu Arg Gln Glu Lys Phe Glu Phe Ala Gln His Gln Phe Gln
        580   585   590

Leu Ala Leu Gln Ile Asn Pro Arg Ser Ser Val Ile Met Cys Tyr Tyr
        595   600   605

Gly Ile Ala Leu His Glu Ser Lys Arg Asn Asp Glu Ala Leu Met Met
    610   615   620

Met Glu Lys Ala Val Leu Thr Asp Ala Lys Asn Pro Leu Pro Lys Tyr
625   630   635   640

Tyr Lys Ala His Ile Leu Thr Ser Leu Gly Asp Tyr His Lys Ala Gln
            645   650   655

Lys Val Leu Glu Glu Leu Lys Glu Cys Ala Pro Gln Glu Ser Ser Val
            660   665   670

His Ala Ser Leu Gly Lys Ile Tyr Asn Gln Leu Lys Gln Tyr Asp Lys
        675   680   685

Ala Val Leu His Phe Gly Ile Ala Leu Asp Leu Ser Pro Ser Pro Ser
        690   695   700

Asp Ala Val Lys Ile Lys Ala Tyr Met Glu Arg Leu Ile Leu Pro Asp
705   710   715   720

Glu Leu Val Thr Glu Glu Asn Leu
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<212>   PRT

<213>   Artificial Sequence

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<223>   Synthetic Peptide

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        35   40   45

Asn Gln Ala Tyr Ser Ala Tyr His Leu Leu Lys Gly Thr Gln Met Ala
    50   55   60

Gln Ser Arg Tyr Leu Phe Ala Leu Ser Cys Phe Gln Met Asp Leu Leu
65   70   75   80

Asn Glu Ala Glu Ser Ala Leu Cys Pro Val Asn Glu Pro Gly Ala Glu
                85   90   95

Ile Pro Asn Gly Ala Ala Gly His Tyr Leu Leu Gly Leu Ile Tyr Lys
            100   105   110

Lys Asn Ala Ala Gln Gln Phe Lys Gln Ser Leu Thr Ile Asp Pro Leu
        115   120   125

Leu Trp Ala Ala Tyr Glu Glu Leu Cys Ile Leu Gly Ala Ala Glu Glu
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Ala Thr Ala Val Phe Gly Glu Thr Ala Ala Leu Ser Ile Gln Lys Gln
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            20   25   30

Phe Pro Ser Glu Val Asn Leu Gln Leu Leu Ala Arg Cys Tyr Leu Ser
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            50   55   60

Pro Gln Ser Arg Tyr Leu Phe Ala Phe Ser Cys Phe Lys Leu Asp Leu
65   70   75   80

Leu Gly Glu Ala Glu Ala Ala Leu Leu Pro Cys Glu Asp Tyr Ala Glu
                85   90   95

Glu Val Pro Gly Gly Ala Ala Gly His Tyr Leu Leu Gly Leu Ile Tyr
            100   105   110

Arg Tyr Ser Gly Arg Lys Asn Cys Ser Ile Gln Gln Phe Arg Met Ala
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Leu Ser Phe Asp Pro Leu Cys Trp Glu Ala Tyr Gly Glu Leu Cys Ser
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Gly Leu Ser Gln Thr Glu His Ile Pro Gly Glu Asn Gln Gln Asp Leu
        195   200   205

Lys Ile Met Gln Gln Pro Gly Asp Ile Pro Pro Asn Thr Asp Arg Gln
    210   215   220

Leu Ser Thr Asn Gly Trp Asp Leu Asn Thr Pro Ser Pro Val Leu Leu
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Gln Val Met Asp Ala Pro Pro Pro Leu Leu Leu Lys Asn Met Arg Arg
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Pro Ala Val Glu Gly Ser Leu Met Ser Val His Gly Val Arg Val Arg
        260   265   270

Arg Arg Asn Phe Phe Ser Glu Glu Leu Ser Ala Glu Ala Gln Glu Glu
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Ser Gly Arg Arg Arg Ser Ala Arg Ile Ala Ala Arg Lys Lys Asn Pro
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Ser Glu Ser Asn Tyr Ala Pro Ser Leu Ser Ser Met Ile Gly Lys Cys
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Arg Ile Gln Ser Ser Lys Glu Ala Thr Thr Ser Gly Gln Ser Val Ser
        340   345   350

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Asp Thr Gly Ser Ser Val Asp Asp Glu Glu Lys Ser Asn Pro Ser Glu
        355   360   365

Ser Ser Pro Asp Arg Phe Ser Leu Ile Ser Gly Ile Ser Glu Val Leu
        370   375   380

Ser Ile Leu Lys Ile Leu Gly Asp Gly His Arg His Leu His Met Tyr
385   390   395   400

Lys Cys Gln Glu Ala Leu Leu Ala Tyr Gln Lys Leu Ser Gln Lys Gln
                405   410   415

Tyr Asn Thr His Trp Val Leu Met Gln Val Gly Lys Ala Tyr Phe Glu
                420   425   430

Leu Gln Asp Tyr Phe Asn Ala Asp Ser Ser Phe Thr Leu Ala His Gln
        435   440   445

Lys Tyr Pro Tyr Ala Leu Glu Gly Met Asp Thr Tyr Ser Thr Val Leu
        450   455   460

Tyr His Leu Lys Glu Glu Met Arg Leu Gly Tyr Leu Ala Gln Glu Leu
465   470   475   480

Ile Ser Val Asp Arg Leu Ser Pro Glu Ser Trp Cys Ala Val Gly Asn
                485   490   495

Cys Tyr Ser Leu Arg Lys Asp His Asp Thr Ala Leu Lys Met Phe Gln
        500   505   510

Arg Ala Ile Gln Leu Asn Glu Arg Phe Thr Tyr Ala His Thr Leu Cys
        515   520   525

Gly His Glu Phe Ala Ala Leu Glu Glu Phe Glu Asp Ala Glu Arg Cys
        530   535   540

Tyr Arg Lys Ala Leu Gly Ile Asp Thr Arg His Tyr Asn Ala Trp Tyr
545   550   555   560

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Gly Leu Gly Met Thr Tyr Leu Arg Gln Glu Lys Phe Glu Phe Ala Gln
            565   570   575

His Gln Phe Gln Leu Ala Leu Gln Ile Asn Pro Arg Ser Ser Val Ile
            580   585   590

Met Cys Tyr Tyr Gly Ile Ala Leu His Glu Ser Lys Arg Asn Asp Glu
        595   600   605

Ala Leu Met Met Met Glu Lys Ala Val Leu Thr Asp Ala Lys Asn Pro
    610   615   620

Leu Pro Lys Tyr Tyr Lys Ala His Ile Leu Thr Ser Leu Gly Asp Tyr
625   630   635   640

His Lys Ala Gln Lys Val Leu Glu Glu Leu Lys Glu Cys Ala Pro Gln
            645   650   655

Glu Ser Ser Val His Ala Ser Leu Gly Lys Ile Tyr Asn Gln Leu Lys
            660   665   670

Gln Tyr Asp Lys Ala Val Leu His Phe Gly Ile Ala Leu Asp Leu Ser
        675   680   685

Pro Ser Pro Ser Asp Ala Val Lys Ile Lys Ala Tyr Met Glu Arg Leu
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Ile Leu Pro Asp Glu Leu Val Thr Glu Glu Asn Leu
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<212>   PRT

<213>   Artificial Sequence

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<211> 739

<212> PRT

<213> Arabidopsis thaliana

<400> 13

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Val Tyr Lys Asn Ala Ile Phe Met Cys Glu Arg Leu Cys Ala Glu Phe
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Pro Ser Glu Val Asn Leu Gln Leu Leu Ala Thr Ser Tyr Leu Gln Asn
        35   40   45

Asn Gln Ala Tyr Ser Ala Tyr His Leu Leu Lys Gly Thr Gln Met Ala
    50   55   60

Gln Ser Arg Tyr Leu Phe Ala Leu Ser Cys Phe Gln Met Asp Leu Leu
65   70   75   80

Asn Glu Ala Glu Ser Ala Leu Cys Pro Val Asn Glu Pro Gly Ala Glu
                85   90   95

Ile Pro Asn Gly Ala Ala Gly His Tyr Leu Leu Gly Leu Ile Tyr Lys
            100   105   110

Lys Asn Ala Ala Gln Gln Phe Lys Gln Ser Leu Thr Ile Asp Pro Leu
    115   120   125

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Leu Trp Ala Ala Tyr Glu Glu Leu Cys Ile Leu Gly Ala Ala Glu Glu
    130               135               140
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Ala Thr Ala Val Phe Gly Glu Thr Ala Ala Leu Ser Ile Gln Lys Gln
145               150               155               160
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Tyr Met Gln Gln Leu Ser Thr Ser Leu Gly Leu Asn Thr Tyr Asn Glu
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Glu Arg Asn Ser Thr Ser Thr Lys Asn Thr Ser Ser Glu Asp Tyr Ser
              180               185               190
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Pro Arg Gln Ser Lys His Thr Gln Ser His Gly Leu Lys Asp Ile Ser
              195               200               205
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Gly Asn Phe His Ser His Gly Val Asn Gly Gly Val Ser Asn Met Ser
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Phe Tyr Asn Thr Pro Ser Pro Val Ala Ala Gln Leu Ser Gly Ile Ala
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Pro Pro Pro Leu Phe Arg Asn Phe Gln Pro Ala Val Ala Asn Pro Asn
              245               250               255
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Ser Leu Ile Thr Asp Ser Ser Pro Lys Ser Thr Val Asn Ser Thr Leu
              260               265               270
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Gln Ala Pro Arg Arg Lys Phe Val Asp Glu Gly Lys Leu Arg Lys Ile
              275               280               285
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Ser Gly Arg Leu Phe Ser Asp Ser Gly Pro Arg Arg Ser Ser Arg Leu
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Ser Ala Asp Ser Gly Ala Asn Ile Asn Ser Ser Val Ala Thr Val Ser
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Gly Asn Val Asn Asn Ala Ser Lys Tyr Leu Gly Gly Ser Lys Leu Ser
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Ser Leu Ala Leu Arg Ser Val Thr Leu Arg Lys Gly His Ser Trp Ala
                340   345   350

Asn Glu Asn Met Asp Glu Gly Val Arg Gly Glu Pro Phe Asp Asp Ser
                355   360   365

Arg Pro Asn Thr Ala Ser Thr Thr Gly Ser Met Ala Ser Asn Asp Gln
    370   375   380

Glu Asp Glu Thr Met Ser Ile Gly Gly Ile Ala Met Ser Ser Gln Thr
385   390   395   400

Ile Thr Ile Gly Val Ser Glu Ile Leu Asn Leu Leu Arg Thr Leu Gly
                405   410   415

Glu Gly Cys Arg Leu Ser Tyr Met Tyr Arg Cys Gln Glu Ala Leu Asp
                420   425   430

Thr Tyr Met Lys Leu Pro His Lys His Tyr Asn Thr Gly Trp Val Leu
                435   440   445

Ser Gln Val Gly Lys Ala Tyr Phe Glu Leu Ile Asp Tyr Leu Glu Ala
    450   455   460

Glu Lys Ala Phe Arg Leu Ala Arg Leu Ala Ser Pro Tyr Cys Leu Glu
465   470   475   480

Gly Met Asp Ile Tyr Ser Thr Val Leu Tyr His Leu Lys Glu Asp Met
                485   490   495

Lys Leu Ser Tyr Leu Ala Gln Glu Leu Ile Ser Thr Asp Arg Leu Ala
                500   505   510

Pro Gln Ser Trp Cys Ala Met Gly Asn Cys Tyr Ser Leu Gln Lys Asp
                515   520   525

His Glu Thr Ala Leu Lys Asn Phe Leu Arg Ala Val Gln Leu Asn Pro
    530   535   540

Arg Phe Ala Tyr Ala His Thr Leu Cys Gly His Glu Tyr Thr Thr Leu
545   550   555   560

Glu Asp Phe Glu Asn Gly Met Lys Ser Tyr Gln Asn Ala Leu Arg Val
                565   570   575

Asp Thr Arg His Tyr Asn Ala Trp Tyr Gly Leu Gly Met Ile Tyr Leu
            580   585   590

Arg Gln Glu Lys Leu Glu Phe Ser Glu His His Phe Arg Met Ala Phe
        595   600   605

Leu Ile Asn Pro Ser Ser Ser Val Ile Met Ser Tyr Leu Gly Thr Ser
    610   615   620

Leu His Ala Leu Lys Arg Ser Glu Glu Ala Leu Glu Ile Met Glu Gln
625   630   635   640

Ala Ile Val Ala Asp Arg Lys Asn Pro Leu Pro Met Tyr Gln Lys Ala
            645   650   655

Asn Ile Leu Val Cys Leu Glu Arg Leu Asp Glu Ala Leu Glu Val Leu
            660   665   670

Glu Glu Leu Lys Glu Tyr Ala Pro Ser Glu Ser Ser Val Tyr Ala Leu
        675   680   685

Met Gly Arg Ile Tyr Lys Arg Arg Asn Met His Asp Lys Ala Met Leu
    690   695   700

His Phe Gly Leu Ala Leu Asp Met Lys Pro Pro Ala Thr Asp Val Ala
705   710   715   720

Ala Ile Lys Ala Ala Met Glu Lys Leu His Val Pro Asp Glu Ile Asp
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Glu Ser Pro

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<213> Arabidopsis thaliana

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ggttcaaaaa cgcctcagtc tcggtattta tttgcattct catgctttaa gttggatctt     240

cttggagagg ctgaagctgc attgttgccc tgtgaagatt atgctgaaga agttcctggt     300

ggtgcagctg ggcattatct tcttggtctt atatatagat attctgggag gaagaactgt     360

tcaatacaac agtttaggat ggcattgtca tttgatccat tgtgttggga agcatatgga     420

gaactttgta gtttaggtgc cgctgaagaa gcctcaacag ttttcgggaa tgttgcttcc     480

cagcgtctta aaacttgtgt agaacaaaga ataagcttct cagaaggagc aaccatagac     540

cagattacag attctgataa ggccttaaaa gatacaggtt tatcgcaaac agaacacatt     600

ccaggagaga accaacaaga tctgaaaatt atgcagcagc ctggagatat tccaccaaat     660

actgacaggc aacttagtac aaacggatgg gacttgaaca caccttctcc agtgctttta     720

caggtaatgg atgctccacc gcctctgctt cttaagaata tgcgtcgtcc agcagtggaa     780

ggatctttga tgtctgtaca tggagtgcgt gtgcgtcgaa gaaacttttt tagtgaagaa     840

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aaaaagaatc ctatgtcgca gtcatttgga aaagattccc attggttaca tctttcacct     960

tccgagtcaa actatgcacc ttctctttcc tcgatgattg gaaaatgcag aatccaaagc    1020

agcaaagaag caacgacgtc aggccagtct gtaagtgaca ctggaagctc tgttgatgat    1080

gaggaaaagt caaatcctag tgaatcttcc ccggatcgtt tcagccttat ttctggaatt    1140

tcagaagtgc taagcattct gaaaattctt ggagatggcc acaggcattt acatatgtac    1200

aagtgtcagg aagctttgtt ggcatatcaa aagctatctc agaaacaata caatacacac    1260
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-25-

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tgggttctca tgcaggttgg aaaagcatat tttgagctac aagactactt caacgctgac    1320

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tccactgttc tttatcacct gaaagaagag atgaggttgg gctatctggc tcaggaactg    1440

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ttcacatatg cacataccct ttgtggccac gagtttgccg cattggaaga attcgaggat    1620

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gcaaagaatc cgctccccaa gtactacaag gctcacatat taaccagcct aggtgattat    1920

cacaaagcac agaaagtttt agaagagctc aaagaatgtg ctcctcaaga aagcagtgtc    1980

catgcatcgc ttggcaaaat atacaatcag ctaaagcaat acgacaaagc cgtgttacat    2040

ttcggcattg ctttggattt aagcccttct ccatctgatg ctgtcaagat aaaggcttac    2100

atggagaggt tgatactacc agacgagctg gtgacggagg aaaatttgta gatttattgt    2160

gcaggtaata caccagatta tgtttctcat ataacccaaa gtcatctgta atttttctca    2220

tctttagatc agtcttgtgg actaaccta aaacaaaact gattatataa acttagaggg    2280

taatattaca gaaaattgta tagagttggg tttgaatttt catttctttt ccaagttgga    2340

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<213> Arabidopsis thaliana

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ttagccacca gctacctgca gaataatcaa gcttacagtg catatcatct gctaaaggga     180

acacaaatgg ctcagtcccg atacttgttc gcattatcat gcttccagat ggaccttctc     240

aatgaagctg aatctgcact ctgccctgtt aatgaacctg gtgcggagat cccaaatggt     300

gcagcaggcc attaccttct tggacttatt tacaagaaga atgctgctca acaatttaaa     360

cagtccttga caatagaccc tctactttgg gctgcatatg aggaattatg tatattaggt     420

gctgctgagg aagcaactgc agtttttggt gaaacagctg ctctctccat tcaaaagcag     480

tatatgcaac aactgtcaac ttccctcggc ttaaacactt acaacgagga acgtaattca     540

acttctacta aaaacacgag ttctgaagat tatagtccaa ggcagtctaa acacacacaa     600

agccatggcc ttaaagatat ctccggaaat ttccattctc atggagttaa tggaggtgtt     660

tcgaacatgt cattctataa tacgccttcg ccagtggctg cacagctatc cggtatagct     720

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gacagttctc caaagtccac tgttaactct actcttcaag cacctagaag aaagtttgta     840

gatgaaggaa agttacgtaa gatttctggc agactatttt ctgattctgg tccacgacgg     900

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ggaaatgtga caacgcttc caagtatttg ggaggttcta aattgagttc tttggcactt    1020

cgttctgtaa cacttcggaa gggacactcc tgggcaaatg aaaacatgga tgaaggggtc    1080

cgtggggaac cttttgatga ttcaaggcct aatactgcct caacgactgg ttctatggct    1140

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atcacaattg gtgtttcgga aattttaaac ctccttagga cactcggaga agggtgtaga    1260

ctttcataca tgtacaggtg tcaggaggca ctggatacgt atatgaaact tccacataag    1320

cattataata caggatgggt tctttcccag gtcgggaaag catactttga actaattgac    1380

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gagcatcact tcagaatggc tttcctaata aacccgagtt cctctgttat aatgtcttat     1860

ttagggacat ctttgcatgc cttgaagaga agtgaggaag cactagagat aatggagcaa     1920

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aaagccatgc ttcatttcgg tctagcttta gatatgaaac cgcctgcaac tgacgttgct     2160

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Xaa Xaa

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<213>   Artificial Sequence

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<210> 20

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<210> 21

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-35-

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gatggcaaat  cgttcttgct  ttcctctaac  cgatgtgtag  gattgacatc  cactgaagca     2040

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gattctggat  gaccagaaga  aagtaggaga  cgagataact  caaaagcatg  cagatgatag     2580

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-37-

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-38-

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